

This Page Is Inserted by IFW Operations
and is not a part of the Official Record

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

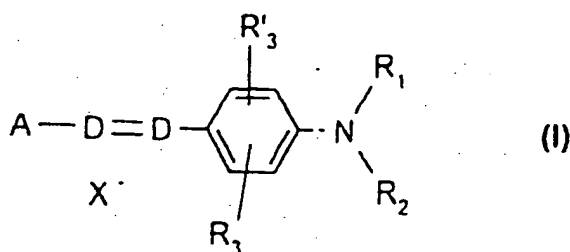
IMAGES ARE BEST AVAILABLE COPY.

**As rescanning documents *will not* correct images,
please do not report the images to the
Image Problem Mailbox.**

What is claimed is:

1. A composition for dyeing keratin fibers, said composition comprising, in a medium suitable for dyeing,

(i) at least one cationic direct dye of formula (I), (II), (III) or (III') below:



wherein, in said formula (I):

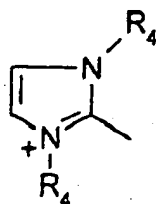
D represents a nitrogen atom or a -CH group,

R₁ and R₂ are identical or different and represent a hydrogen atom, a C₁-C₄ alkyl radical which is unsubstituted or substituted with a -CN, -OH or -NH₂ radical, or R₁ and R₂ form, with a carbon atom of the benzene ring, an optionally oxygenated or nitrogenous heterocycle which is unsubstituted or substituted with one or more C₁-C₄ alkyl radicals, or a 4'-aminophenyl radical;

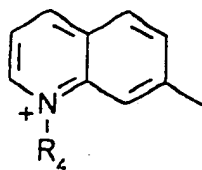
R₃ and R'₃ are identical or different and represent a hydrogen atom, a halogen atom selected from chlorine, bromine, iodine and fluorine, a cyano group, a C₁-C₄ alkyl radical, or a C₁-C₄ alkoxy or acetyloxy radical;

X⁻ represents an anion;

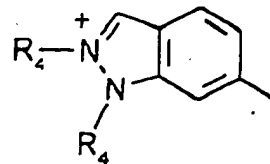
A represents a group selected from structures A1 to A19 below:



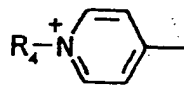
A₁



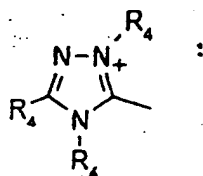
A₂



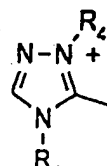
A₃



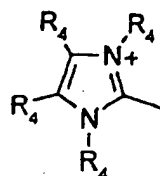
A₄



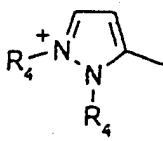
A₅



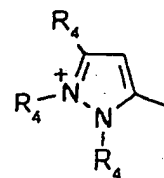
A₆



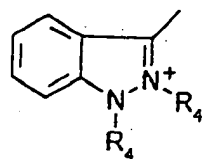
A₇



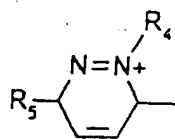
A₈



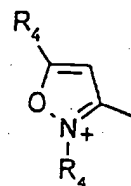
A₉



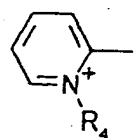
A₁₀



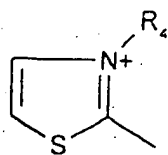
A₁₁



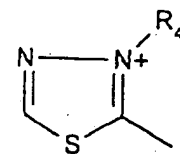
A₁₂



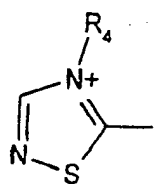
A₁₃



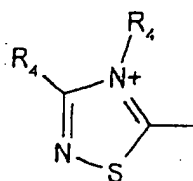
A₁₄



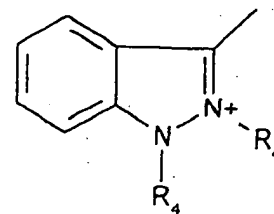
A₁₅



A₁₆



A₁₇

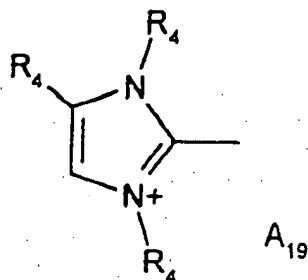


A₁₈

LAW OFFICES

INNEGAN, HENDERSON,
FARABOW, GARRETT,
& DUNNER, L.L.P.
1300 I STREET, N.W.
WASHINGTON, D. C. 20005
202-408-4000

and

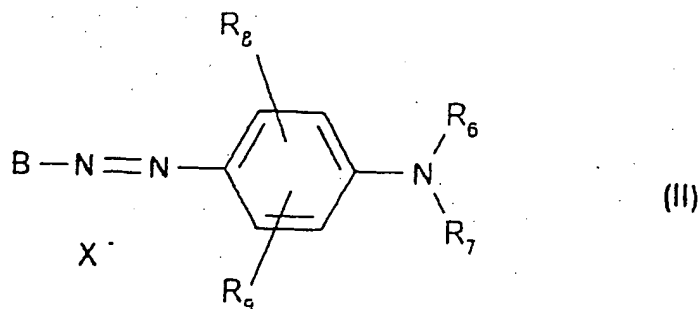


wherein

R₄ represents a C₁-C₄ alkyl radical which is unsubstituted or substituted with a hydroxyl radical; and

R₅ represents a C₁-C₄ alkoxy radical;

with the proviso that when D represents -CH, A represents A₄ or A₁₃, and R₃ is other than an alkoxy radical, then R₁ and R₂ do not simultaneously represent a hydrogen atom;



wherein, in said formula (II):

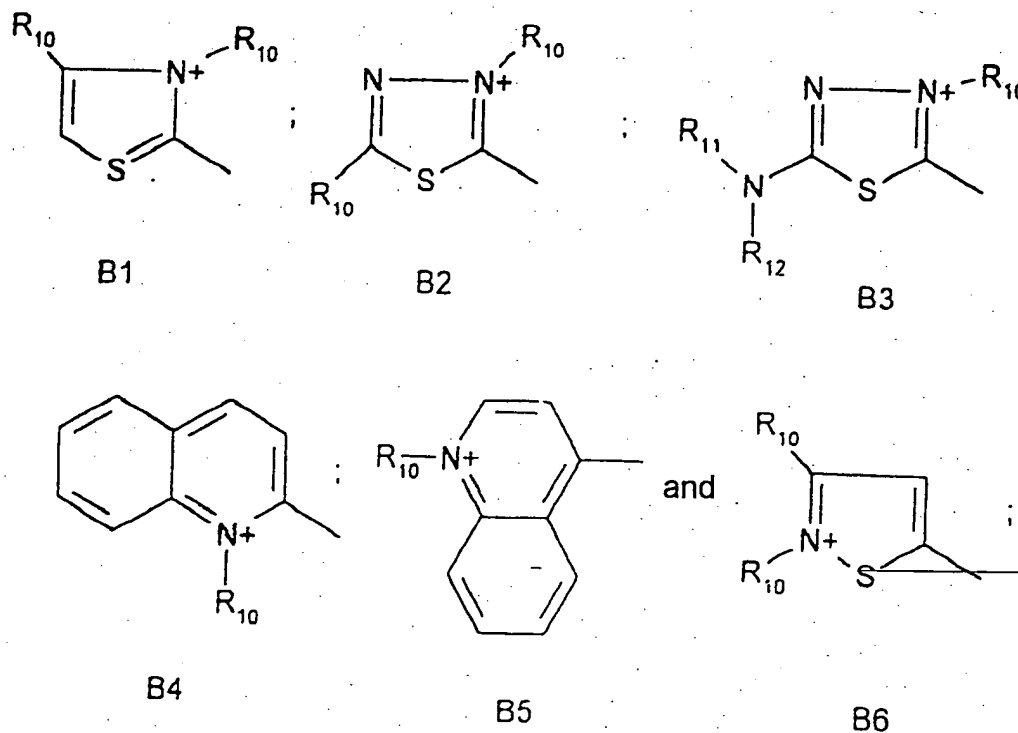
R₆ represents a hydrogen atom or a C₁-C₄ alkyl radical;

R_7 represents a hydrogen atom, an alkyl radical which is unsubstituted or substituted with a -CN radical or with an amino group, a 4'-aminophenyl radical, or R_7 forms, with R_6 , an optionally oxygenated and/or nitrogenous heterocycle which is unsubstituted or substituted with a C_1 - C_4 alkyl radical;

R_8 and R_9 are identical or different and represent a hydrogen atom, a halogen atom, a C_1 - C_4 alkyl or C_1 - C_4 alkoxy radical, or a -CN radical;

X^- represents an anion;

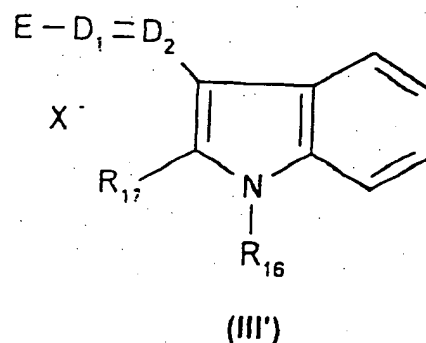
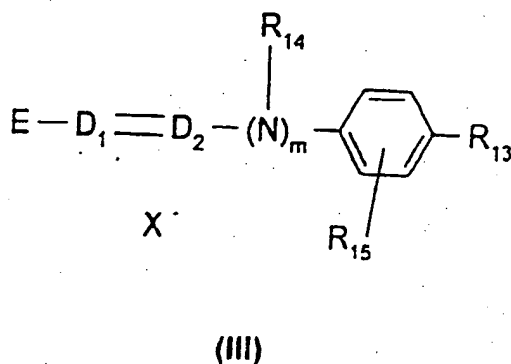
B represents a group selected from structures B1 to B6 below:



wherein

R_{10} represents a C_1 - C_4 alkyl radical;

R_{11} and R_{12} , which are identical or different, represent a hydrogen atom or a C_1 - C_4 alkyl radical;



wherein, in said formulae (III) and (III'):

R_{13} represents a hydrogen atom, a C_1 - C_4 alkoxy radical, a halogen atom, or an amino radical;

R_{14} represents a hydrogen atom, a C_1 - C_4 alkyl radical, or R_{14} forms, with a carbon atom of the benzene ring, a heterocycle which is optionally oxygenated and/or substituted with one or more C_1 - C_4 alkyl groups;

R_{15} represents a hydrogen atom or a halogen atom;

R_{16} and R_{17} , which are identical or different, represent a hydrogen atom or a C_1 - C_4 alkyl radical;

D_1 and D_2 , which are identical or different, represent a nitrogen atom or a -CH group;

$m = 0$ or 1 ;

LAW OFFICES

NNEGAN, HENDERSON,
FARABOW, GARRETT,
& DUNNER, L.L.P.
1300 I STREET, N.W.
WASHINGTON, D. C. 20005
202-408-4000

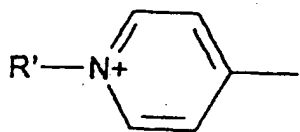
with the proviso that when R_{13} represents an unsubstituted amino group, then D_1 and D_2 simultaneously represent a -CH group and $m = 0$;

X^- represents an anion; and

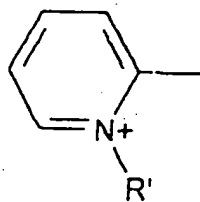
E represents a group selected from structures E1 to E8 below:

LAW OFFICES

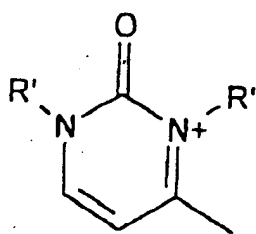
NNEGAN, HENDERSON,
FARABOW, CARRETT,
& DUNNER, L.L.P.
1300 I STREET, N.W.
WASHINGTON, D.C. 20005
202-408-4000



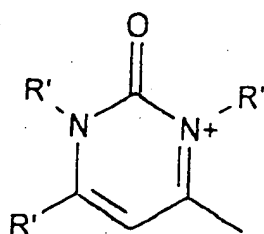
E1



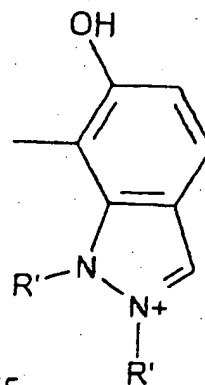
E2



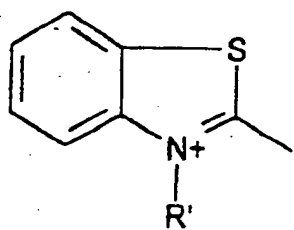
E3



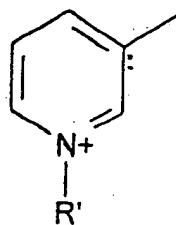
E4



E5

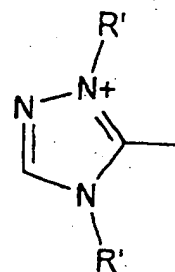


E6



E7

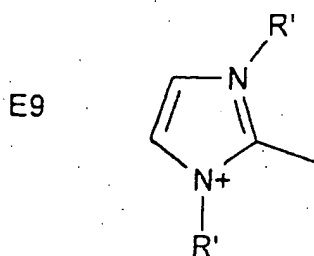
and



E8

wherein R' represents a C₁-C₄ alkyl radical;

with the proviso that when m = 0 and D₁ represents a nitrogen atom, then E can also represent a group of structure E9 below:



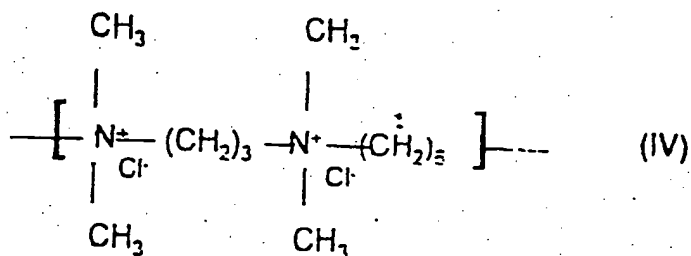
wherein R' represents a C₁-C₄ alkyl radical; and

(ii) at least one cationic or amphoteric substantive polymer selected from the group formed by:

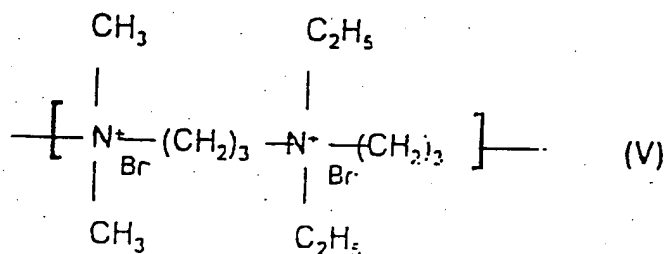
- (a) cellulosic cationic derivatives with the exception of Polyquaternium 10;
- (b) copolymers of dimethyldiallylammonium halide and of (meth)acrylic acid;
- (c) methacryloyloxyethyltrimethylammonium halide homopolymers and copolymers;

(d) polyquaternary ammonium polymers selected from:

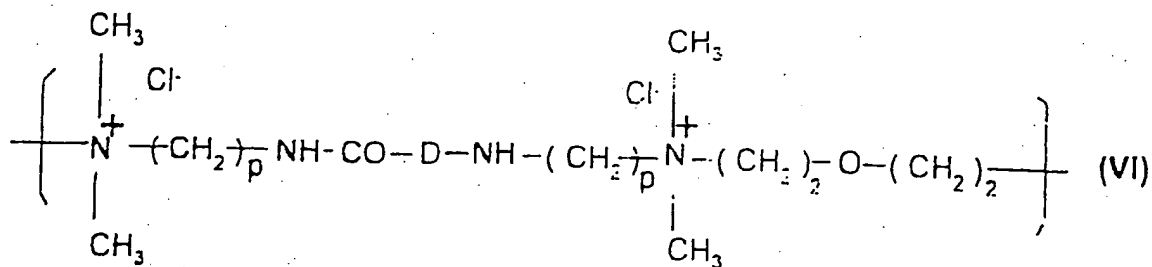
- polymers of repeating units having formula (IV) below:



- polymers of repeating units having formula (V) below:



- and polymers of repeating units having formula (VI) below:



wherein p represents an integer ranging from 1 to 6 approximately, D is zero or represents a group $\text{-(CH}_2\text{)}_r\text{-CO-}$ wherein r represents a number equal to 4 or 7;

and

(e) vinylpyrrolidone copolymers containing cationic units.

2. A composition according to Claim 1, wherein in said formula (I), (II), (III), or (III'), X⁻ represents an anion of chloride, methyl sulfate, or acetate.

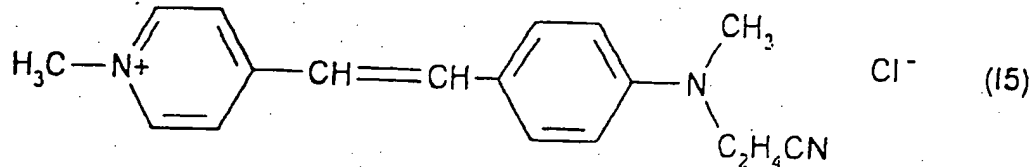
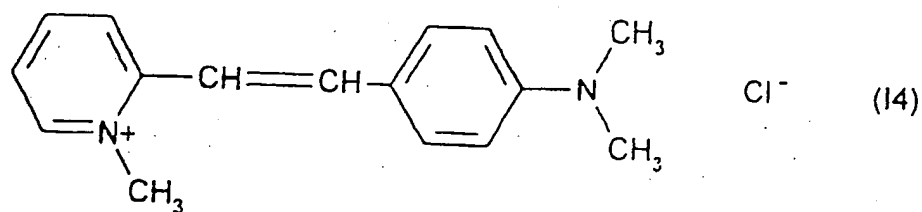
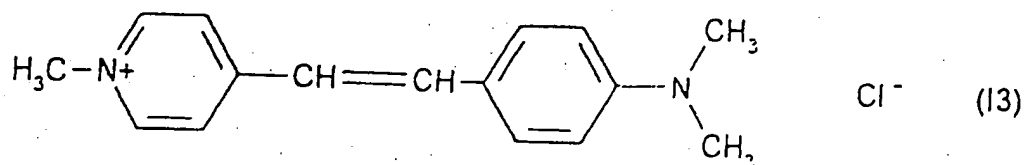
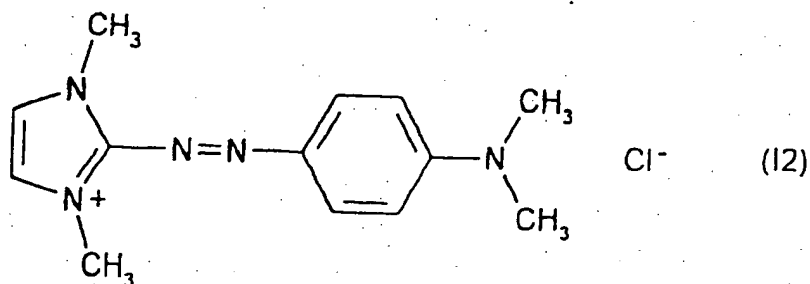
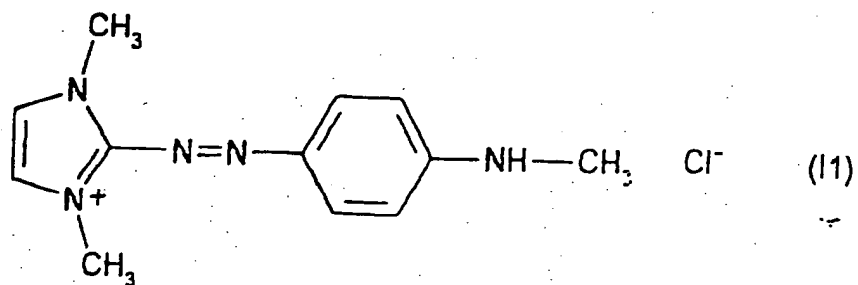
3. A composition according to Claim 1, wherein said keratin fibers are human keratin fibers.

4. A composition according to Claim 3, wherein said human keratin fibers are human hair.

5. A composition according to Claim 1, wherein said at least one cationic direct dye of formula (I) is selected from the compounds having structures (I1) to (I51) and (I53) to (I55) below:

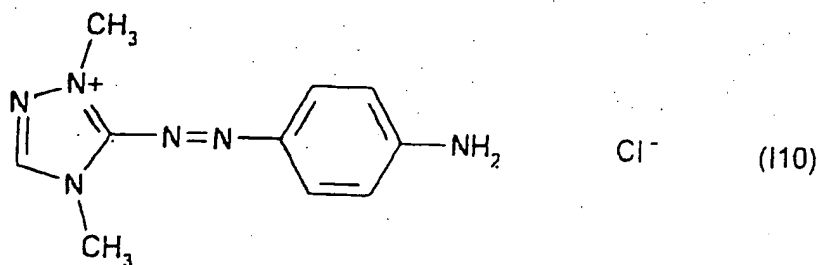
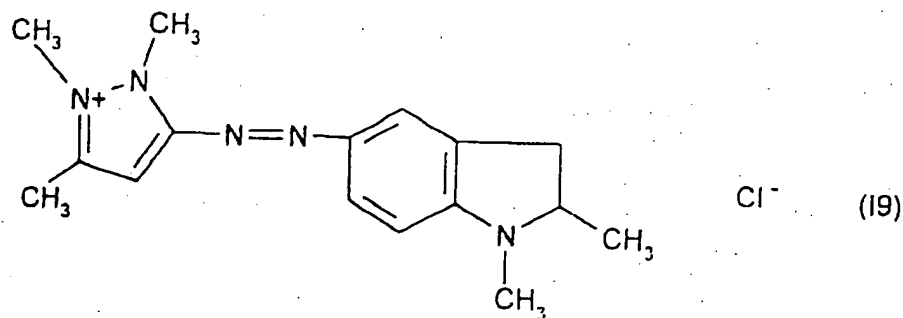
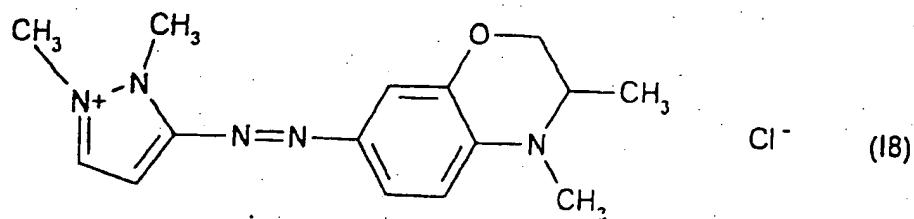
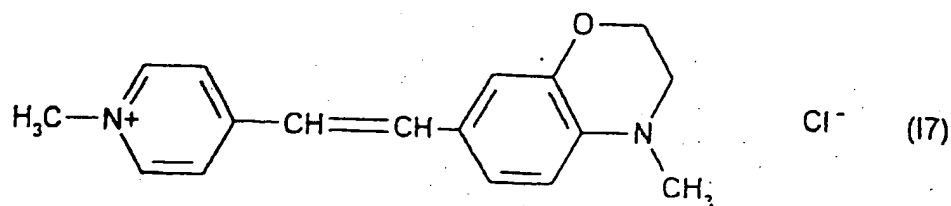
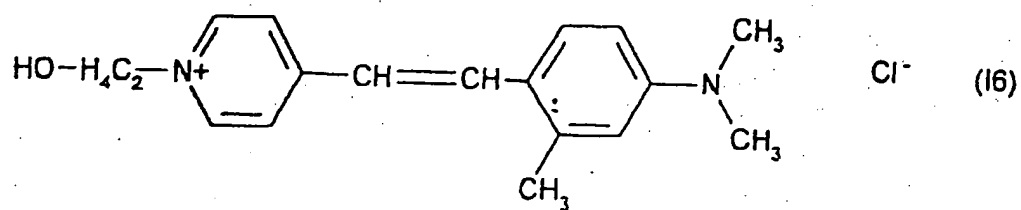
LAW OFFICES

NNEGAN, HENDERSON,
FARABOW, GARRETT,
& DUNNER, L.L.P.
1300 I STREET, N.W.
WASHINGTON, D. C. 20005
202-408-4000



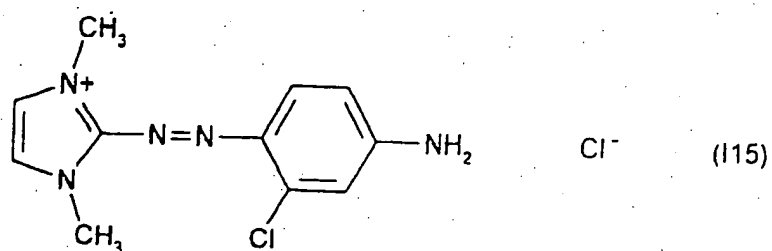
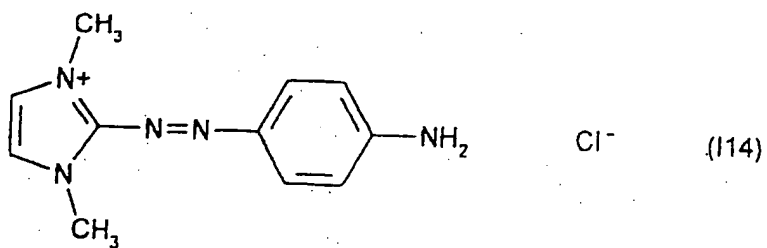
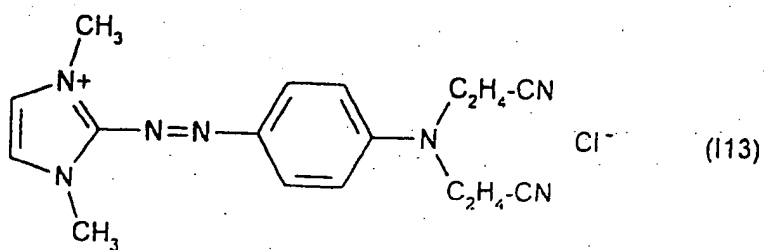
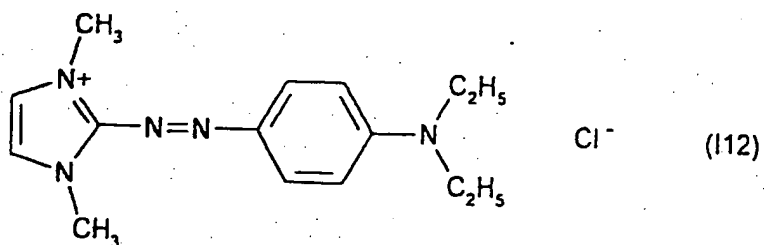
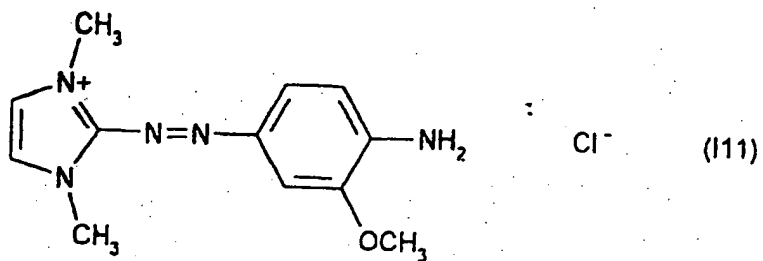
LAW OFFICES

WNEGAN, HENDERSON,
FARABOW, GARRETT,
& DUNNER, L.L.P.
1300 I STREET, N.W.
WASHINGTON, D. C. 20005
202-408-4000



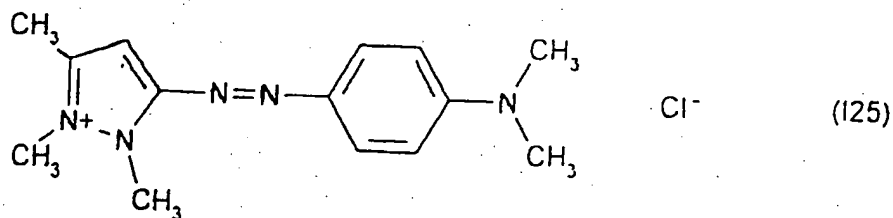
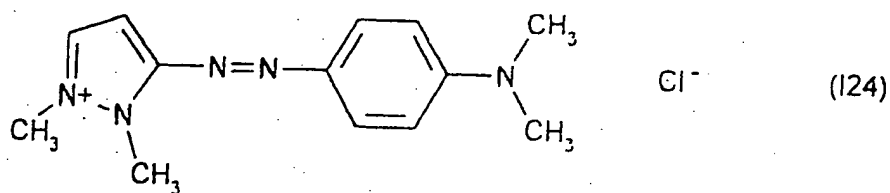
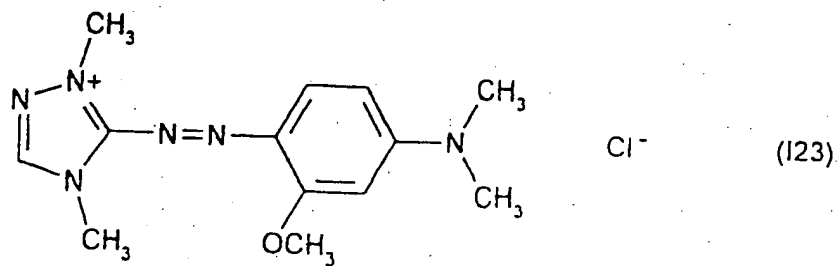
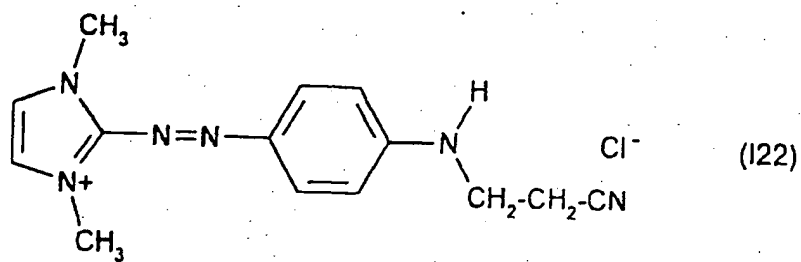
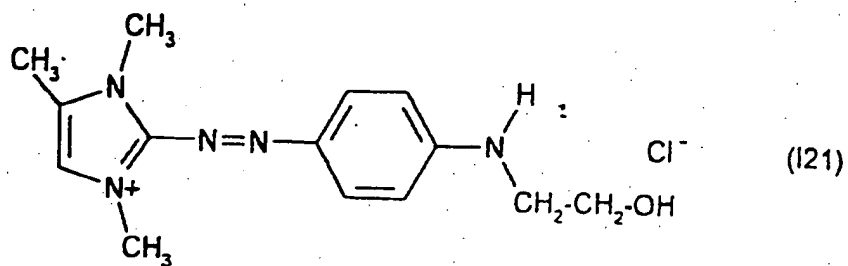
LAW OFFICES

INNEGAN, HENDERSON,
 FARABOW, GARRETT,
 & DUNNER, L.L.P.
 1300 I STREET, N.W.
 WASHINGTON, D. C. 20005
 202-408-4000



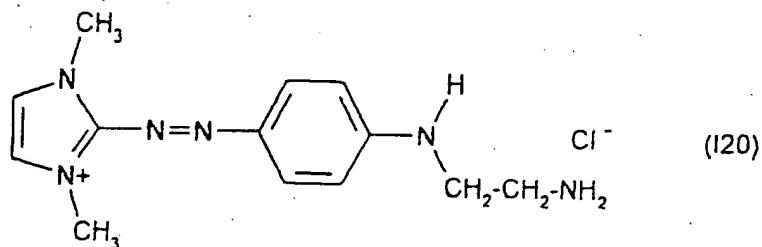
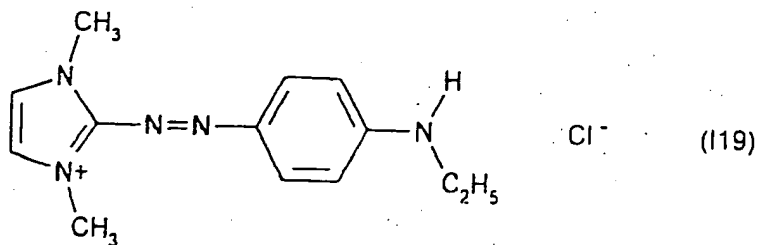
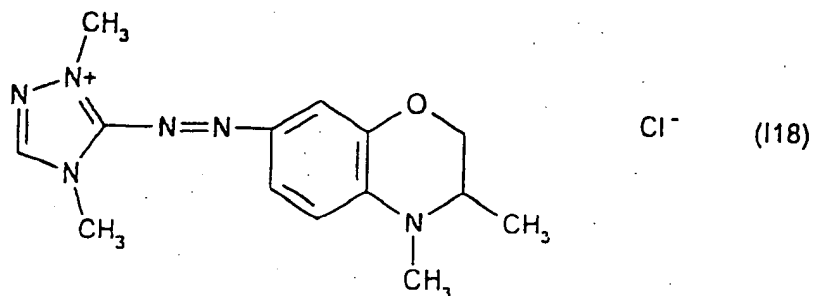
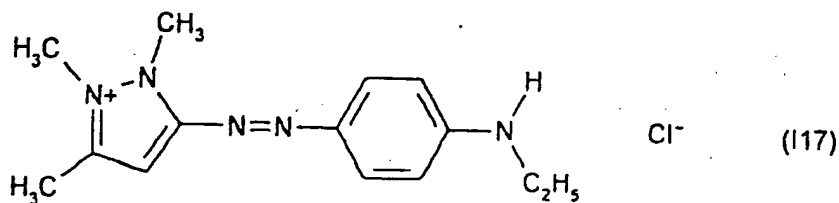
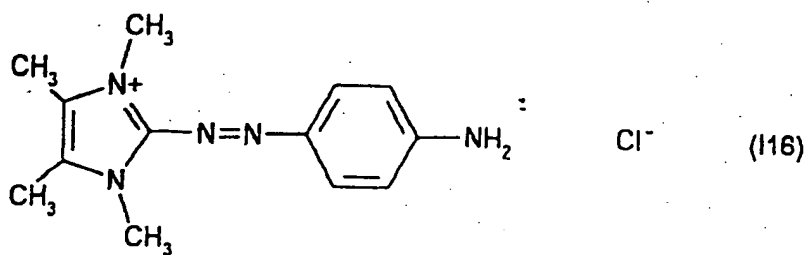
LAW OFFICES

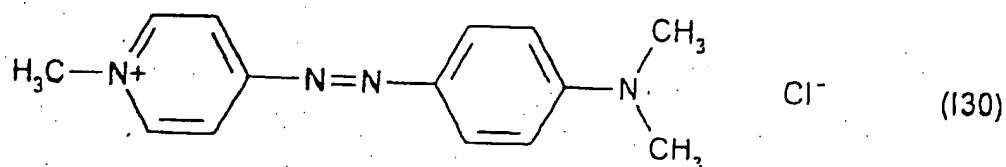
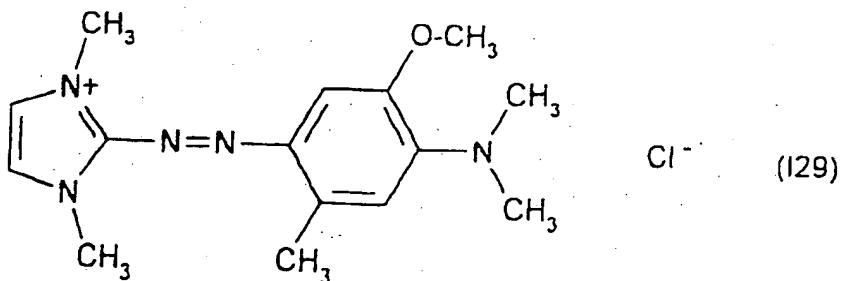
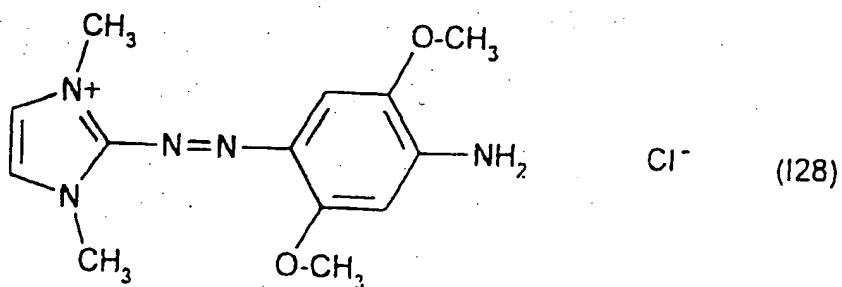
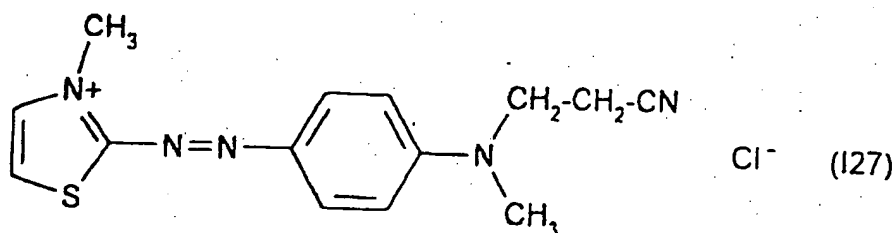
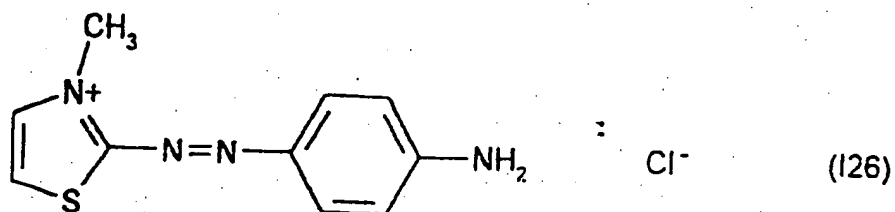
NNECAN, HENDERSON,
FARABOW, GARRETT,
& DUNNER, L.L.P.
1300 I STREET, N.W.
WASHINGTON, D. C. 20005
202-408-4000



LAW OFFICES

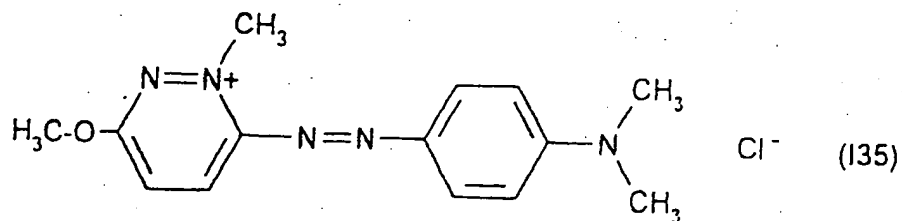
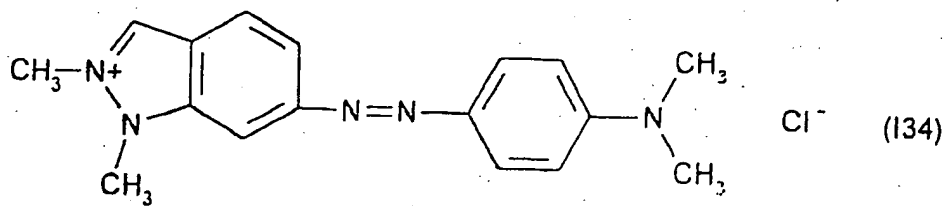
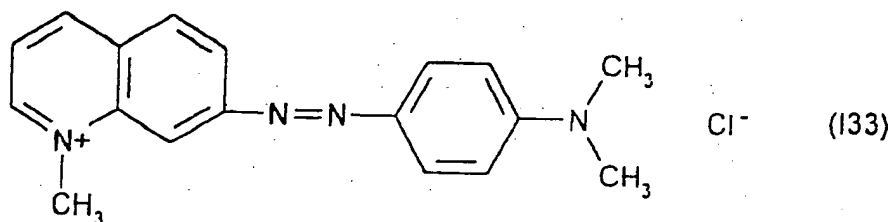
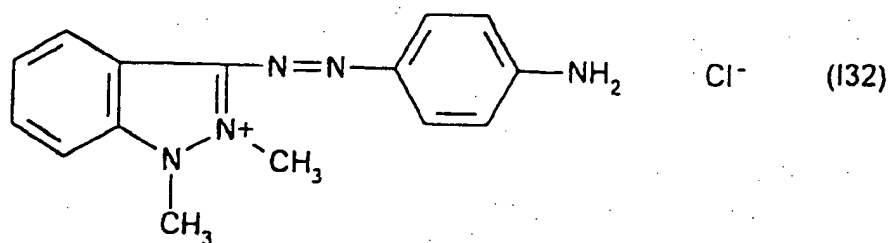
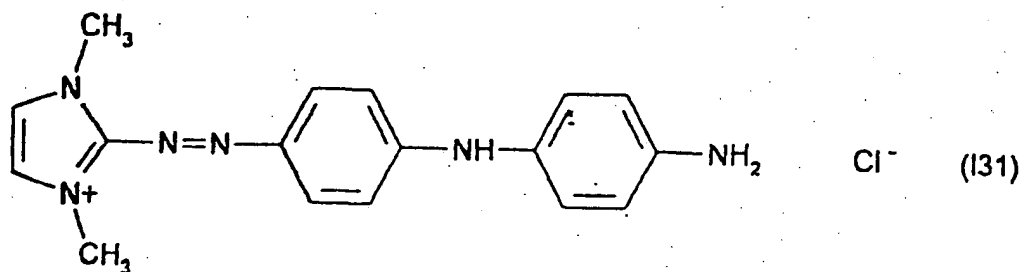
ANNEGAN, HENDERSON,
FARABOW, GARRETT,
& DUNNER, L.L.P.
1300 I STREET, N.W.
WASHINGTON, D. C. 20005
202-408-4000

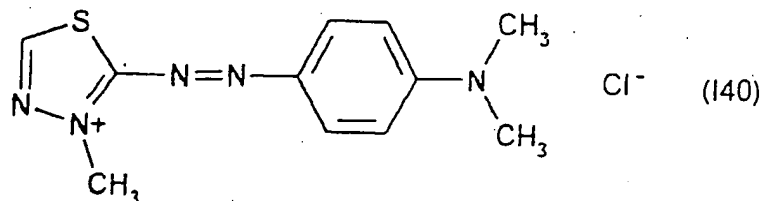
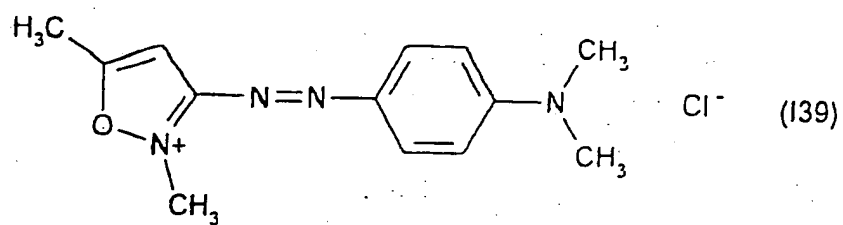
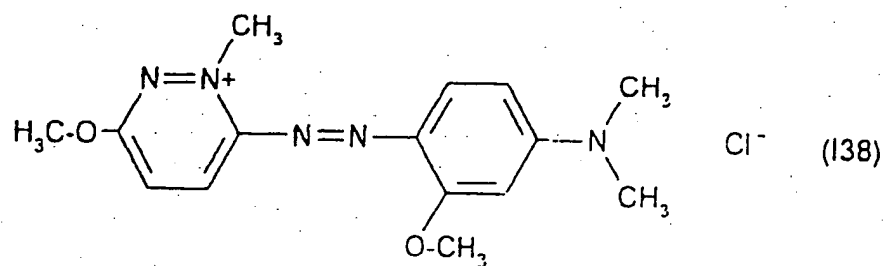
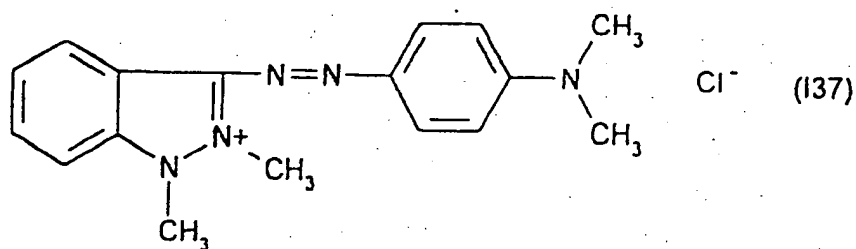
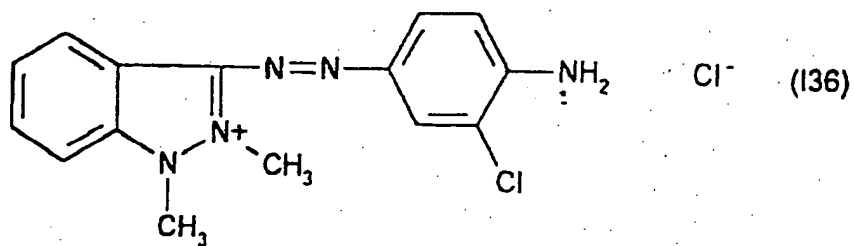




LAW OFFICES

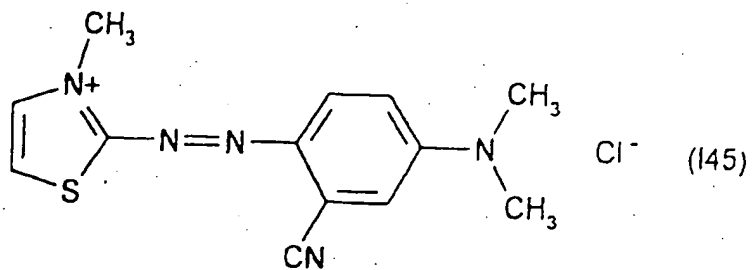
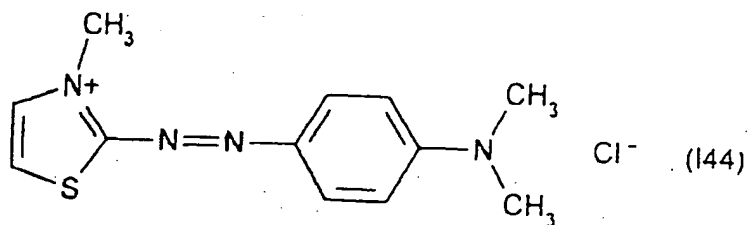
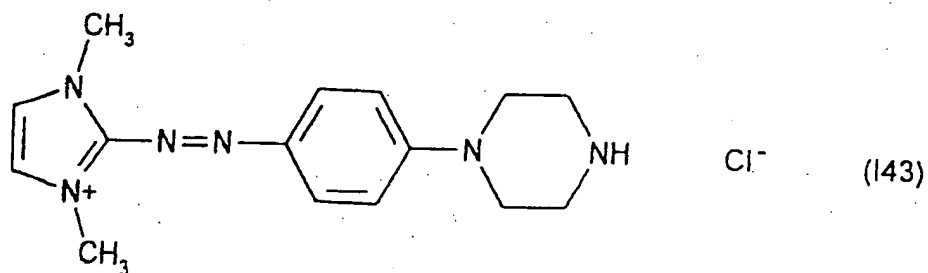
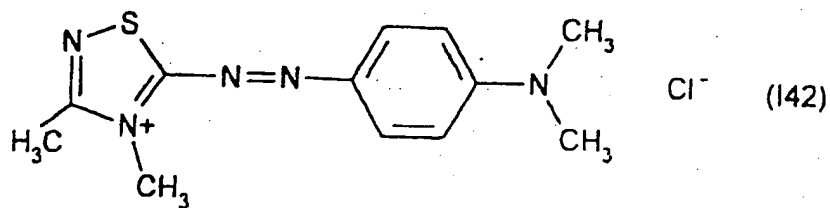
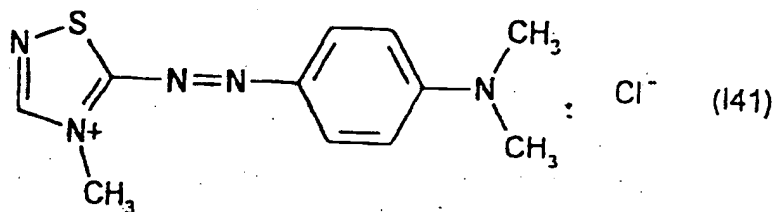
ANNAGAN, HENDERSON,
FARABOW, GARRETT,
& DUNNER, L.L.P.
1300 I STREET, N.W.
WASHINGTON, D.C. 20005
202-408-4000

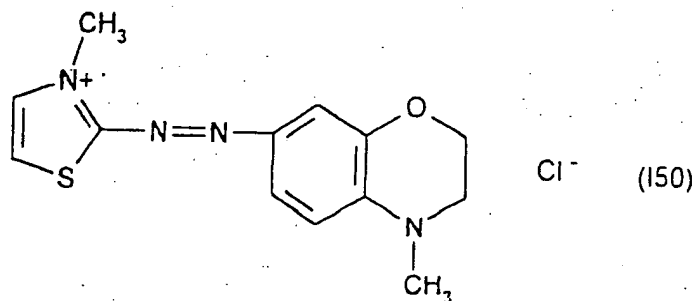
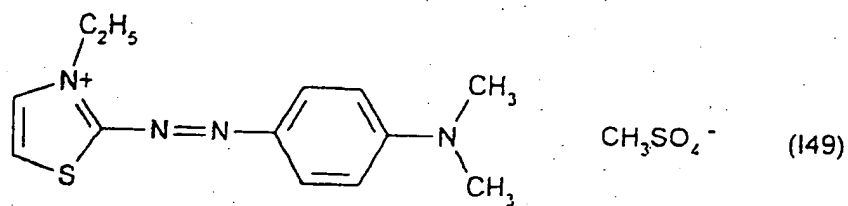
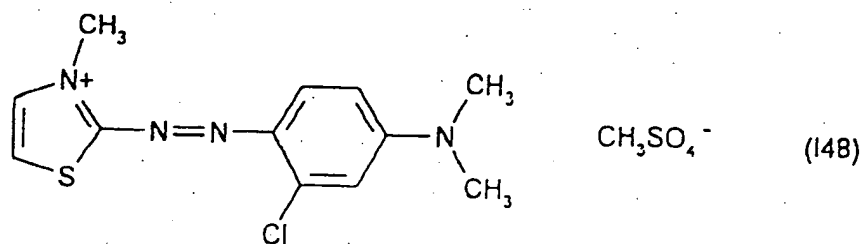
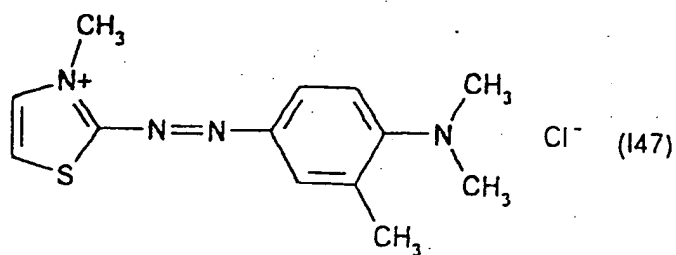
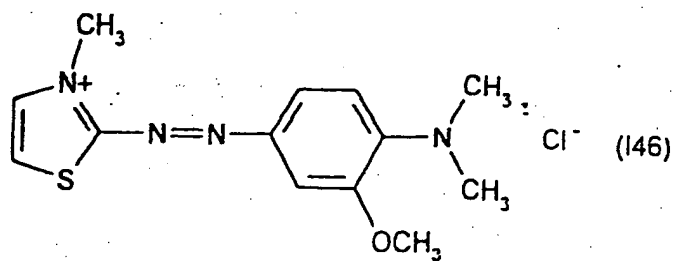




LAW OFFICES

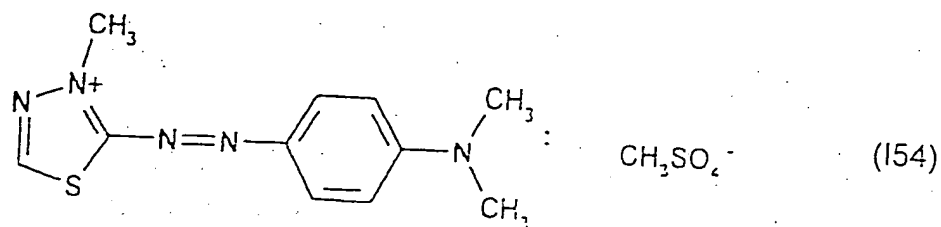
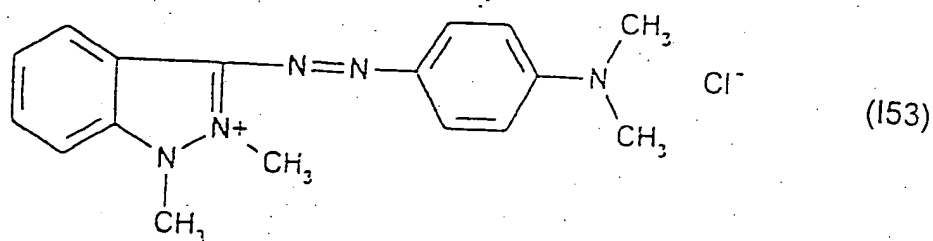
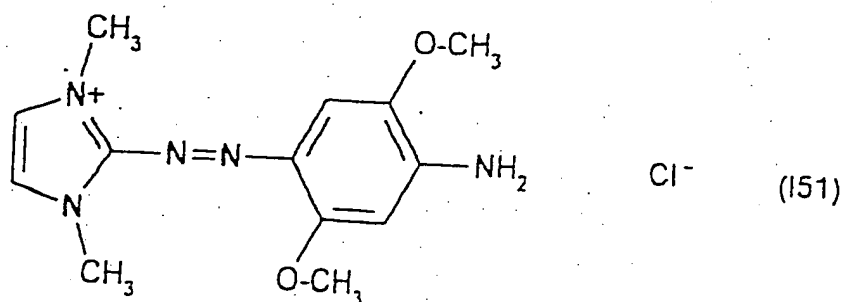
INNEGAN, HENDERSON,
FARABOW, GARRETT,
& DUNNER, L.L.P.
1300 I STREET, N.W.
WASHINGTON, D. C. 20005
202-408-4000



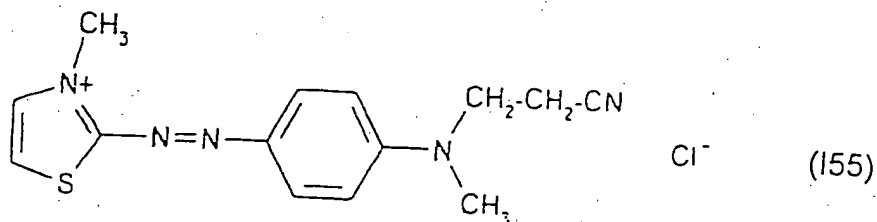


LAW OFFICES

INNEGAN, HENDERSON,
FARABOW, GARRETT,
& DUNNER, L.L.P.
1300 I STREET, N.W.
WASHINGTON, D. C. 20005
202-408-4000



and



LAW OFFICES

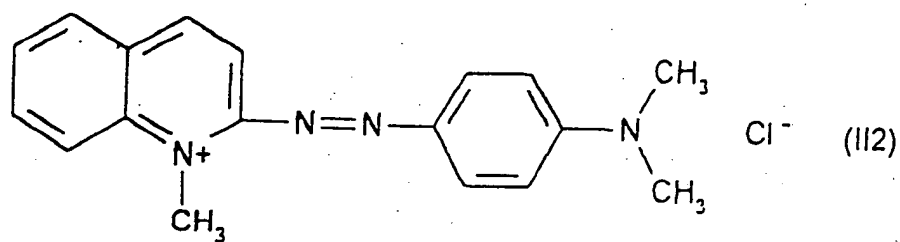
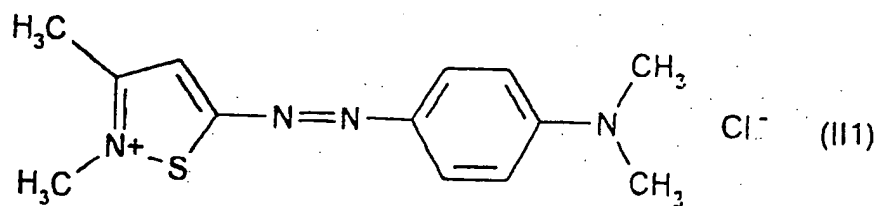
INNEGAN, HENDERSON,
FARABOW, GARRETT,
& DUNNER, L.L.P.
1300 I STREET, N.W.
WASHINGTON, D.C. 20005
202-408-4000

6. A composition according to Claim 5, wherein said at least one cationic direct dye has structure (I1), (I2), (I14) or (I31).

7. A composition according to Claim 1, wherein said at least one cationic direct dye of formula (II) is selected from the compounds having structures (II1) to (II3), (II5), (II6), (II8), and (II10) to (II12) below:

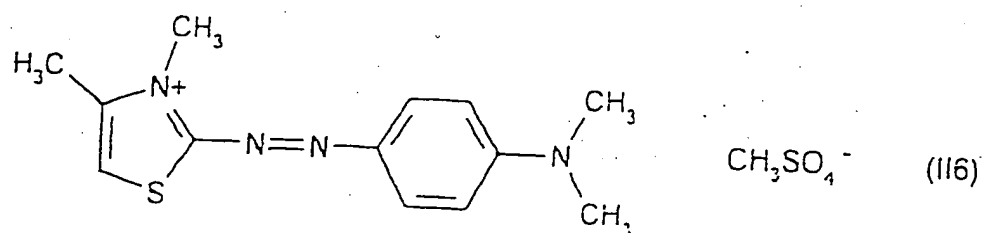
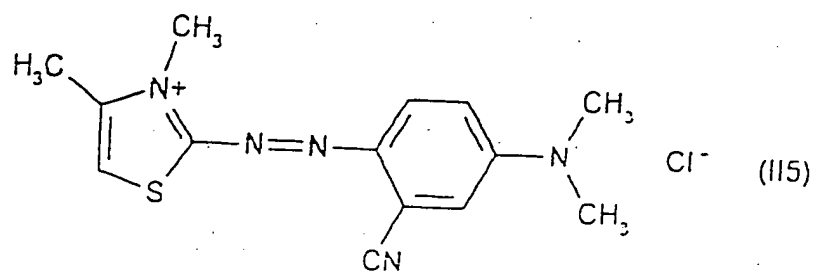
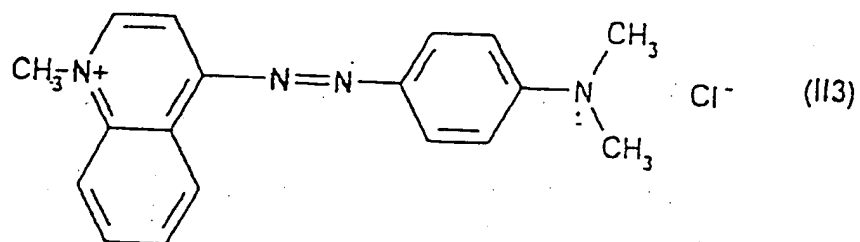
LAW OFFICES

INNEGAN, HENDERSON,
FARABOW, GARRETT,
& DUNNER, L.L.P.
1300 I STREET, N.W.
WASHINGTON, D. C. 20005
202-408-4000



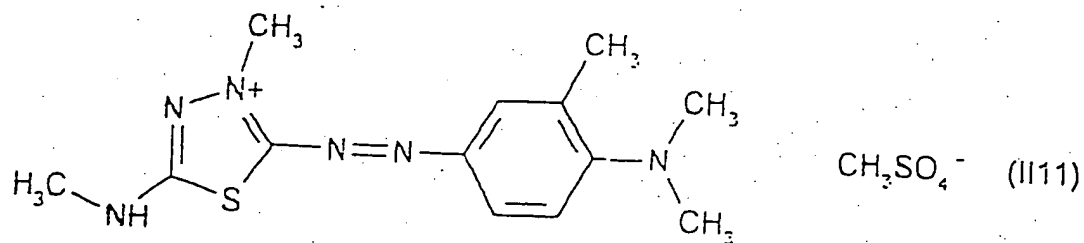
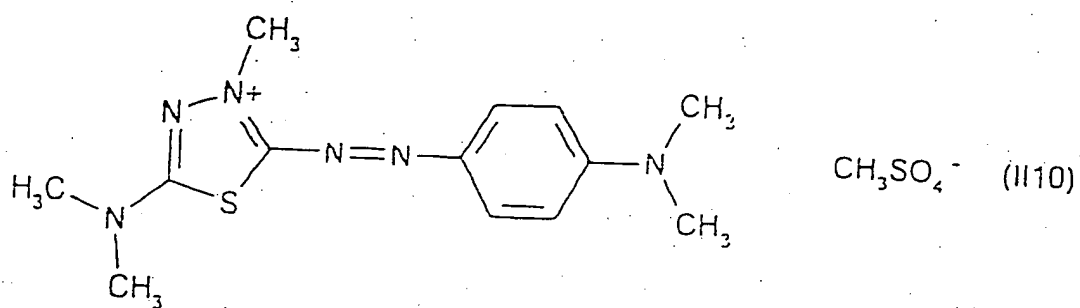
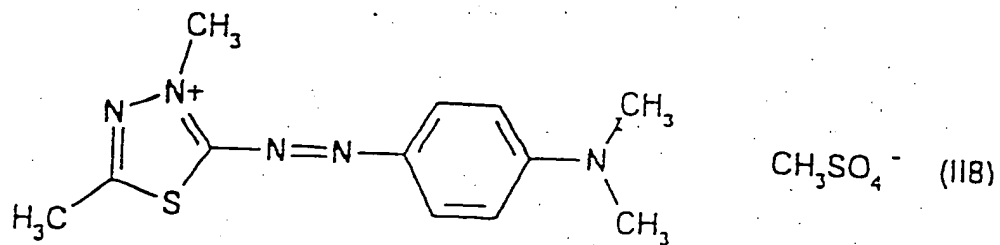
LAW OFFICES

INNEGAN, HENDERSON,
FARABOW, GARRETT,
& DUNNER, L.L.P.
1300 I STREET, N.W.
WASHINGTON, D. C. 20005
202-408-4000



LAW OFFICES

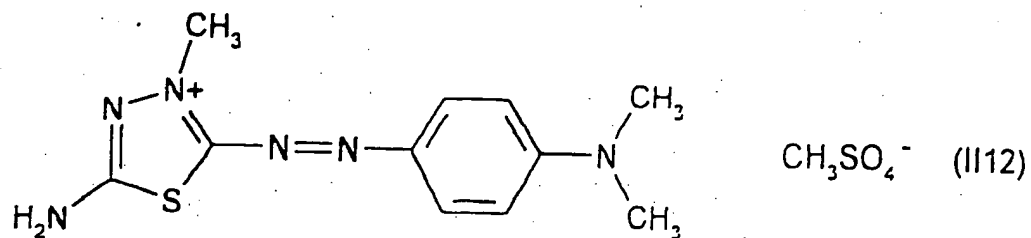
INNENEGAN, HENDERSON,
FARABOW, GARRETT,
& DUNNER, L.L.P.
1300 I STREET, N.W.
WASHINGTON, D.C. 20005
202-408-4000



LAW OFFICES

INNEGAN, HENDERSON,
FARABOW, GARRETT,
& DUNNER, L.L.P.
1300 I STREET, N.W.
WASHINGTON, D.C. 20005
202-408-4000

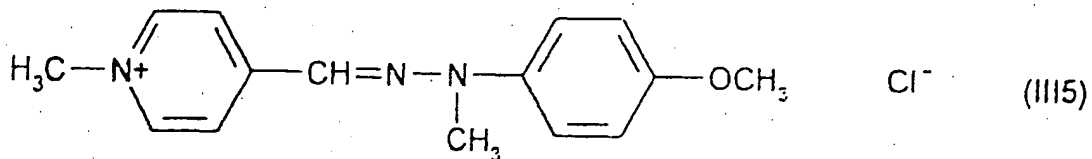
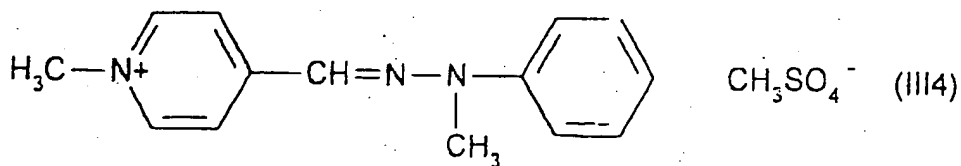
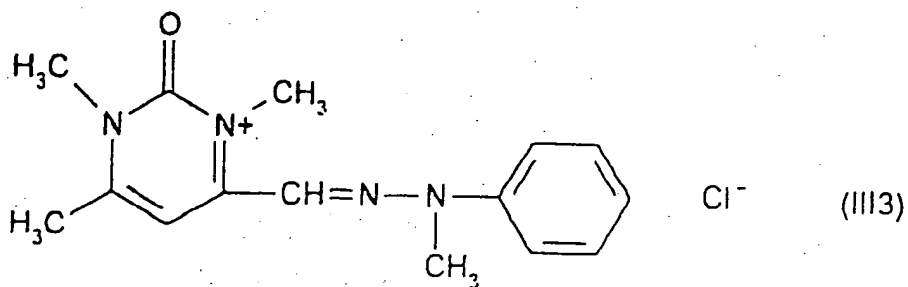
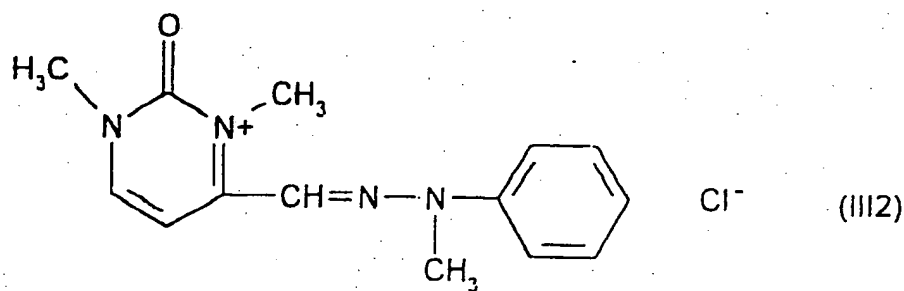
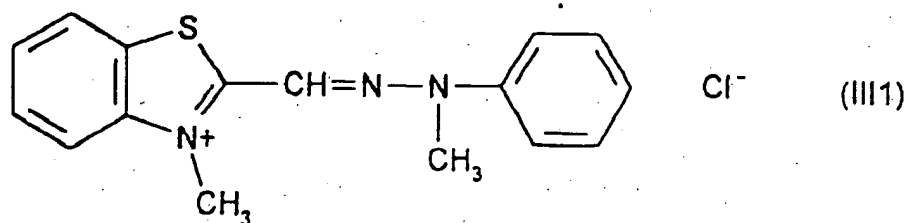
and

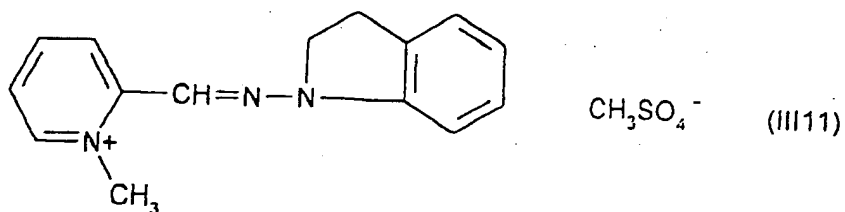
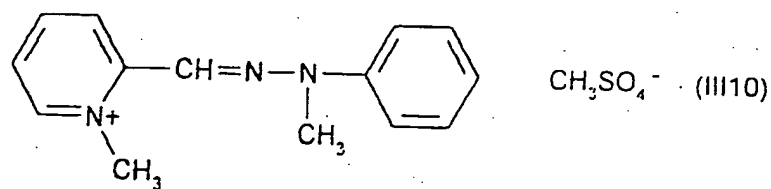
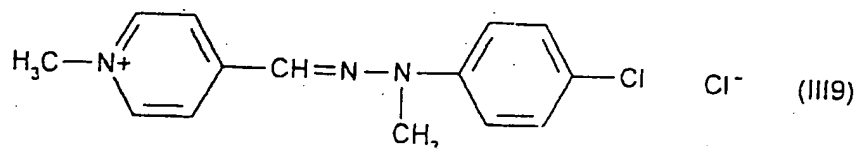
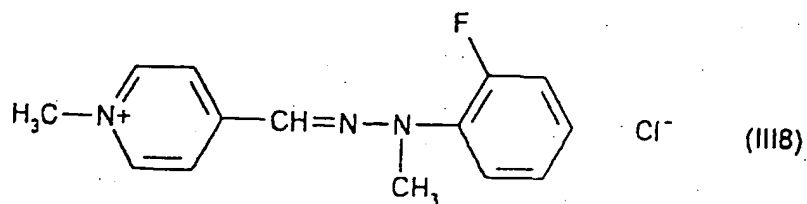
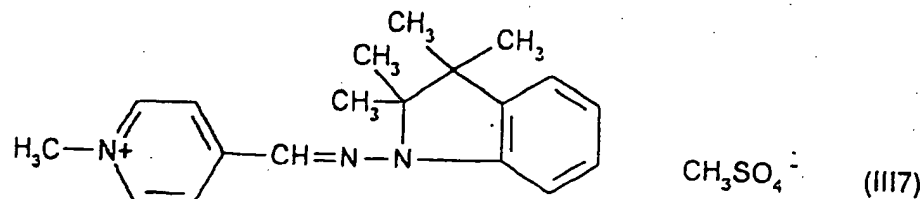
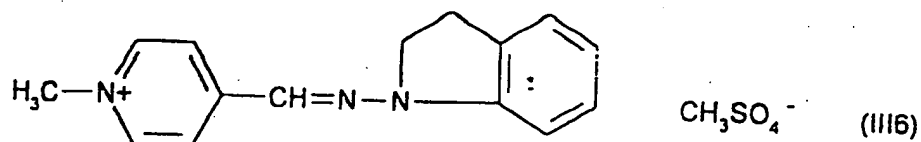


8. A composition according to Claim 1, wherein said at least one cationic direct dye of formula (III) is selected from the compounds having structures (III1) to (III18) below:

LAW OFFICES

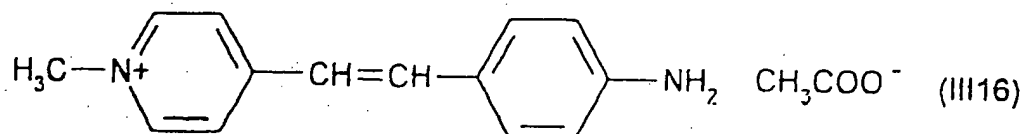
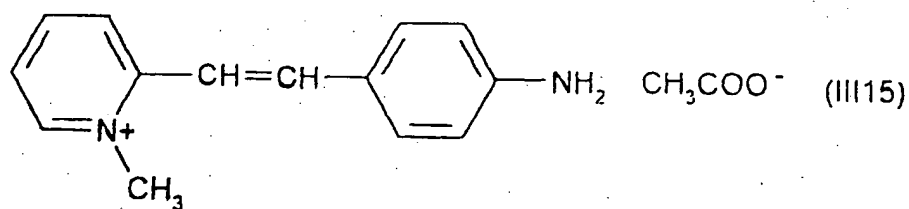
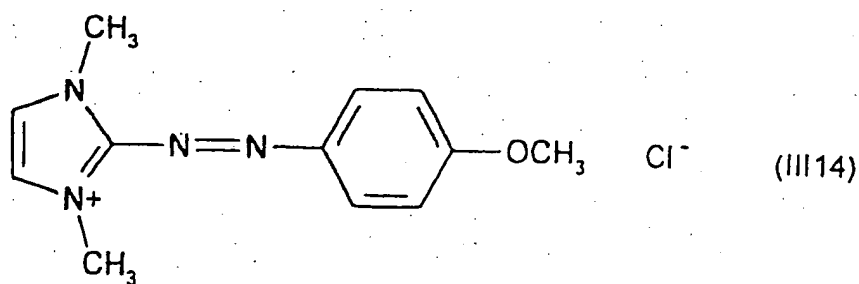
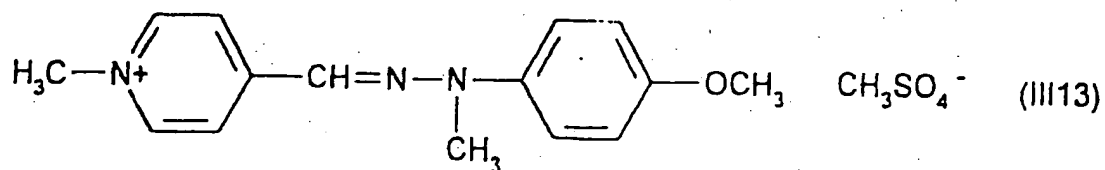
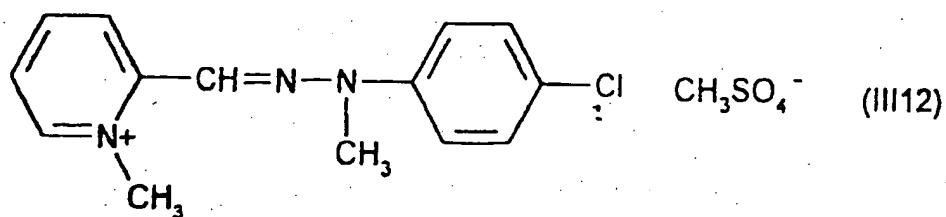
WANNAN, HENDERSON,
FARABOW, GARRETT,
& DUNNER, L.L.P.
1300 I STREET, N.W.
WASHINGTON, D. C. 20005
202-408-4000

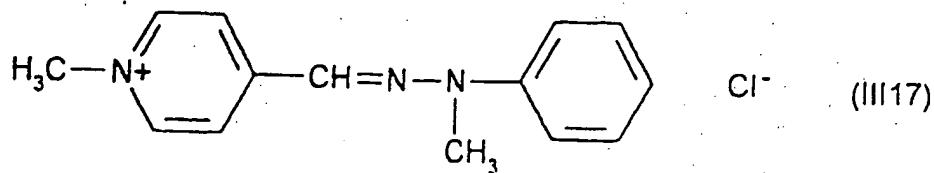




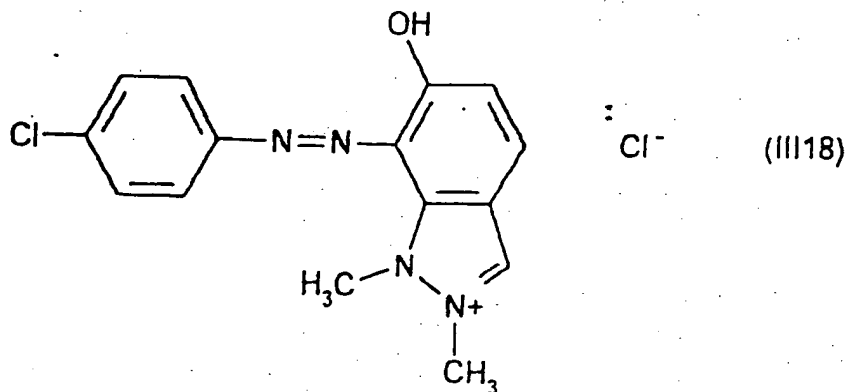
LAW OFFICES

INNEGAN, HENDERSON,
 FARABOW, GARRETT,
 & DUNNER, L.L.P.
 1300 I STREET, N.W.
 WASHINGTON, D.C. 20005
 202-408-4000





and

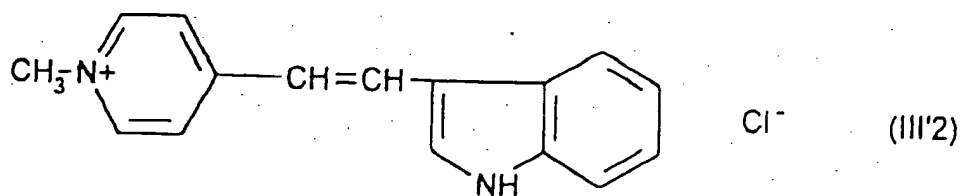
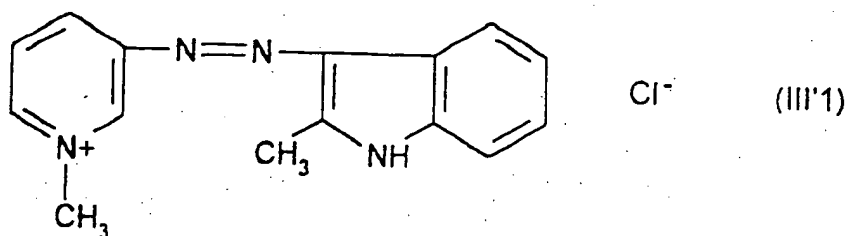


9. A composition according to Claim 8, wherein said at least one cationic direct dye of formula (III) has structure (III4), (III5) or (III13).

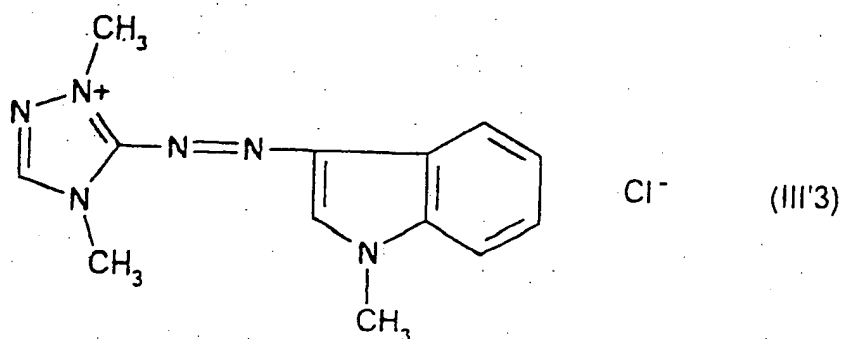
10. A composition according to Claim 1, wherein said at least one cationic direct dye of formula (III') is selected from the compounds having structures (III'1) to (III'3) below:

LAW OFFICES

INNEGAN, HENDERSON,
 FARABOW, GARRETT,
 & DUNNER, L.L.P.
 1300 I STREET, N.W.
 WASHINGTON, D. C. 20005
 202-408-4000



and



11. A composition according to Claim 1, wherein said at least one cationic direct dye of formulae (I), (II), (III) or (III') is present in an amount ranging from about 0.001 to about 10% by weight relative to the total weight of the composition.

12. A composition according to Claim 11, wherein said at least one cationic direct dye of formulae (I), (II), (III) or (III') is present in amount ranging from about 0.005 to about 5% by weight relative to the total weight of the composition.

13. A composition according to Claim 1, wherein said at least one

cationic or amphoteric substantive polymer is Polyquaternium 24.

14. A composition according to Claim 1, wherein said at least one cationic or amphoteric substantive polymer is a copolymer of dimethyldiallylammonium chloride and of acrylic acid (80/20 by weight).

15. A composition according to Claim 1, wherein said at least one cationic or amphoteric substantive polymer is a crosslinked poly(methacryloyloxyethyltrimethylammonium chloride) homopolymer, as a 50% dispersion in mineral oil; the crosslinked copolymer of acrylamide and of methacryloyloxyethyltrimethylammonium chloride (20/80 by weight), as a 50% dispersion in mineral oil; or the methosulphate of the copolymer of methacryloyloxyethyl-trimethylammonium and of methacryloyloxyethyl-dimethyl-acetylammonium.

16. A composition according to Claim 1, wherein said at least one cationic or amphoteric substantive polymer is:

- a) a vinylpyrrolidone polymer containing dimethylaminoethyl methacrylate units;
- b) a vinylpyrrolidone polymer containing methacrylamidopropyltrimethylammonium units; or
- c) a vinylpyrrolidone polymer containing methylvinylimidazolium units.

17. A composition according to Claim 1, wherein said at least one cationic or amphoteric substantive polymer is present in an amount ranging from about 0.01 to about 10% by weight relative to the total weight of the composition.

18. A composition according to Claim 17, wherein said at least one cationic or amphoteric substantive polymer is present in an amount ranging from about 0.1 to about 5% by weight relative to the total weight of the composition.

19. A composition according to Claim 1, wherein said medium suitable for dyeing comprises water or a mixture of water and at least one organic solvent.

20. A composition according to Claim 1, wherein said composition has a pH ranging from about 2 to about 11.

21. A composition according to Claim 20, wherein said composition has a pH ranging from about 5 to about 10.

22. A composition according to Claim 1, further comprising at least one additional direct dye.

23. A composition according to Claim 22, wherein said at least one additional direct dye is a nitrobenzene dye, anthraquinone dye, naphthoquinone dye, triarylmethane dye, xanthine dye, or an azo dye that is non-cationic.

24. A composition according to Claim 1, further comprising at least one oxidation base selected from para-phenylenediamines, bis(phenyl)alkylenediamines, para-aminophenols, ortho-aminophenols and heterocyclic bases.

25. A composition according to Claim 24, wherein said at least one oxidation base is present in an amount ranging from about 0.0005 to about 12% by weight relative to the total weight of the dye composition.

26. A composition according to Claim 25, wherein said at least one

oxidation base is present in an amount ranging from about 0.005 to about 6% by weight relative to the total weight of the dye composition.

27. A composition according to Claim 24, further comprising at least one coupler selected from meta-phenylenediamines, meta-aminophenols, meta-diphenols and heterocyclic couplers.

28. A composition according to Claim 27, wherein said at least one coupler is present in an amount ranging from about 0.0001 to about 10% by weight relative to the total weight of the dye composition.

29. A composition according to Claim 28, wherein said at least one coupler is present in an amount ranging from about 0.005 to about 5% by weight relative to the total weight of the dye composition.

30. A composition according to Claim 1, further comprising at least one oxidizing agent.

31. A composition according to Claim 30, wherein said at least one oxidizing agent is hydrogen peroxide, urea peroxide, alkali metal bromate, a persalt, or an enzyme.

32. A method for dyeing keratin fibers, said method comprising applying at least one dyeing composition according to Claim 1 to said keratin fibers, and allowing said at least one dyeing composition to remain on said keratin fibers for a period of time sufficient to develop the desired coloration.

33. A method for dyeing keratin fibers according to Claim 32, further

comprising rinsing said keratin fibers after said period of time sufficient to develop the desired coloration.

34. A method for dyeing keratin fibers according to Claim 33, further comprising, after said rinsing, washing said keratin fibers with shampoo, rinsing said keratin fibers again, and drying said keratin fibers.

35. The method according to Claim 33, wherein said period of time ranges from 3 to 60 minutes.

36. The method according to Claim 35, wherein said period of time ranges from 5 to 40 minutes.

37. A method for dyeing keratin fibers, said method comprising
- (1) mixing a composition (A1), said composition (A1) comprising at least one cationic direct dye of formula (I), (II), (III) or (III') as defined in Claim 1, and at least one oxidation base with a composition (B1), said composition (B1) comprising, in a medium suitable for dyeing, at least one oxidizing agent, wherein said composition (A1) or said composition (B1) contains at least one cationic or amphoteric substantive polymer as defined in Claim 1, and
 - (2) applying said mixture of said composition (A1) and said composition (B1) to said keratin fibers for a period of time sufficient to dye said keratin fibers, wherein said mixing occurs before the time of application to said keratin fibers.

38. A method for dyeing keratin fibers, said method comprising

- (1) mixing a composition (A2), said composition (A2) comprising at least one cationic direct dye of formula (I), (II), (III) or (III') as defined in Claim 1, with a composition (B2), said composition (B2) comprising, in a medium suitable for dyeing, at least one oxidizing agent, wherein said composition (A2) or said composition (B2) contains at least one cationic or amphoteric substantive polymer as defined in Claim 1, and
- (2) applying said mixture of said composition (A2) and said composition (B2) to said keratin fibers for a period of time sufficient to dye said keratin fibers, wherein said mixing occurs before the time of application to said keratin fibers.

39. A multi-compartment dyeing device or multi-compartment dyeing kit for dyeing keratin fibers comprising at least two compartments, wherein

- a first compartment comprises a composition (A1) as defined in Claim 37, and
- a second compartment comprises a composition (B1) as defined in Claim 37.

40. A multi-compartment dyeing device or multi-compartment dyeing kit for dyeing keratin fibers comprising at least two compartments, wherein

- a first compartment comprises a composition (A2) as defined in Claim 38, and
- a second compartment comprises a composition (B2) as defined in Claim 38.

41. A composition according to Claim 1 in the form of a liquid, a

shampoo, a cream, or a gel.

42. A composition according to Claim 41 in the form of a shampoo.

LAW OFFICES

INNEGAN, HENDERSON,
FARABOW, GARRETT,
& DUNNER, L.L.P.
1300 I STREET, N.W.
WASHINGTON, D. C. 20005
202-408-4000